

**PROGRESS REPORT**  
**NASA Cooperative Agreement**  
**For**  
**Aerospace Medicine Residency Training**  
**The University of Texas Medical Branch**  
**June 1, 2012**

This report covers Cooperative Agreement NNX10AT57A for the period of November 2011 through August 2012. During the grant period, there were a total of 7 aerospace medicine residents supported by this grant. Since 1996, 27 residents and fellows have been hired from this program to work at NASA-JSC (Attachment A).

**UTMB and Preventive Medicine and Community Health (PMCH)**

The aerospace medicine residency program at UTMB continues to thrive, and the overall outlook has been strengthened by continuing programs at NASA-JSC, commercial spaceflight activities associated with the FAA Center of Excellence in Commercial Space Transportation, and operational partnerships in commercial spaceflight. The primary physician faculty in aerospace medicine includes Drs. James Vanderploeg, Richard Jennings, and Tarah Castleberry. The residency program coordinator at JSC is Dr. Josef Schmid, and Dr. Laura Rudkin coordinates the graduate program. We partner with Wyle through the NASA Bioastronautics Contract to employ 12 UTMB physicians and psychologists in the Flight Analog Research Unit/Medical Monitoring, Advanced Medical Projects, and operational ISS medical support in Houston, Russia, and Kazakhstan. In addition, the program is supported by a very large cadre of adjunct faculty members. The Charles A. Berry Space Medicine Library provides valuable didactic resources for the residents, other faculty members, space science students, and NASA physicians. Astronaut physician Dr. William Thornton recently donated a large portion of his papers and spaceflight related photographs and materials to the library. Since 2009, the NSBRI, under a cooperative agreement NASA (NCC 9-58), provided seed funds for resident space-based research. We consider early research experience in space-related issues important to NASA and this effort produces specialists with additional skills for support of the human space program. The recent creation of the UTMB Center for Polar Medical Operations (CPMO) and employment of former astronaut Dr. Scott Parazynski as its director offers another avenue for the residents to learn about remote medical care and telemedicine support in an austere analog environment

UTMB partnerships with commercial spaceflight companies Virgin Galactic, Space Adventures, and Zero-G Corporation have enabled the residents to participate in zero-g parabolic flights, spaceflight participant medical evaluations at UTMB, GCTC and IBMP, plus Soyuz launches at Baikonur, Kazakhstan, that we would not normally be available. In addition, residents have been able to conduct space-related science from studies conducted on the Virgin Galactic Founders. UTMB is part of the FAA's Center of Excellence in Commercial Space Transportation with 8 other universities including Stanford University, the University of Colorado, and 33 academic, commercial and governmental entities (including NASA-JSC and NASA-KSC). This center provides training and research opportunities for residents, and UTMB already has 7 medical tasks approved and funded by the FAA Office of Commercial Space Transportation. Residents directly participate in each of these efforts. Residents have also been working directly with Dr. Jon Clark to provide planning, medical monitoring and on-scene EMS care for the Stratos Project high altitude record parachute jump attempt.

In 2011, the residency received continued five-year accreditation from the RRC of the Accreditation Council for Graduate Medical Education (ACGME), and our next review will be in November 2015. We are currently complying with new RRC requirements for preventive medicine residency program that took effect on July 1, 2011. Our MPH program has been certified by the Council for Education in Public Health (CEPH) since October 2006, and in 2009 we received the maximum accreditation of seven years. In 2012, the UTMB Preventive Medicine and Community Health program was selected by the Association for Prevention, Teaching and Research (APTR) for its outstanding Educational Program of the Year Award. This award honors innovative programs, departments or academic institutions involvement in advancing undergraduate or graduate medical education in prevention and public health which promotes further interest in the discipline. The program also recently teamed with Wyle to help coordinate the international students and residents that participate in the 4 week clinical and research electives conducted by NASA-JSC.

UTMB moved to a new Aerospace Medicine Center in August, 2011 that is integrated with a large multispecialty clinic, and the clinical aerospace medicine cases available for resident involvement should increase dramatically.

## **RESIDENCY**

The residency program hosts monthly Aerospace Medicine Grand Rounds presentations and those presented during this agreement period can be seen in Attachment B. The presentations offer Accreditation Council on Continuing Medical Education (CME) credits to the NASA physicians who attend or view the program through the teleconference network. The presentations are presently available at NASA-JSC, NASA-KSC, NASA-HQ, MIT, U.S. Army at Fort Rucker, the Navy's Aerospace Medicine residency program in Pensacola, the Mayo Clinic Scottsdale, the Mayo Clinic Rochester, the University of Colombia, Bogotá, and Star City, Russia. Presentations are also available through video streaming on the internet and are available back to 2000 through web archives of the USRA-Houston at <http://www.dsls.usra.edu/archive.html>

The residency hosts an Aerospace Medicine Journal Club meeting each month. A list of book chapters from the new Davis book *Fundamentals of Aerospace Medicine* and journal articles may be found in Attachment C. Journal Club is available via Skype and is open to the aerospace medicine community, including the military residencies. NASA-JSC physicians and physician contractors attend Journal Club.

The residents must complete a capstone project or thesis to obtain their Master of Public Health (MPH), and the MPH or its equivalent is required to complete the Aerospace Medicine residency. Two residents completed their capstone during this agreement period. A list of the UTMB and military resident capstone projects may be found in Attachment D.

The residency obtains financial support under a cooperative agreement with NASA and from the UT System. The NASA funds are consumed by residency salary requirements and provide minimal support for faculty, support staff, residency infrastructure, or travel. A supplemental grant request has been submitted to NASA and remains on file should NASA funding become available.

## **HONORS and AWARDS 2011-2012**

Stanley R. Mohler Endowed Scholarship presented by the AsMA Foundation: **Jennifer**

**Law.** This scholarship is presented by the AsMA Foundation to an outstanding student or resident to support their studies in aerospace medicine. There were 5 candidates for 2012.

Life Sciences and Bioengineering Branch of the Aerospace Medical Association. Ross McFarland Award: **Becky Blue.** This award is presented by the LSBEB of AsMA to the author of the best student paper accepted by the AsMA Scientific Program Committee that covers a significant achievement in biomedical engineering. There are no nominations for this award—the best abstract from those submitted by students each year is selected by a committee based on scientific merit, clarity of presentation, application of findings, and scope of interest in the outcome. The award is sponsored by Gentex.

Society of NASA Flight Surgeons Outstanding Student and Resident Award: **Jennifer Law**, for her work with shoulder problems in the EMU during EVA training and spaceflight.

Space Medicine Association, Jeff Myers Young Investigator Award: **Becky Blue**  
This award is presented to an individual making their first presentation at the AsMA Annual Scientific Meeting and is based on the presentation, written documentation, and an interview. There were over 90 first time presenters eligible for this award in 2012.

Julian A. Ward Memorial Award for outstanding performance in residency presented by the Aerospace Medical Assn and sponsored by the Society of Air Force Flight Surgeons: **Chuck Mathers.** This coveted national award is selected by the Aerospace Medical Association Awards Committee and presented to the resident who made the most contribution to the field of aerospace medicine during residency training.

Outstanding Overall Resident UTMB, runner-up. **Jennifer Law**

## **ALUMNI AND RESIDENTS**

A listing of previous residents and current residents may be found in Attachment A. A more detailed listing of current residents may be found in Attachment E. During the period, four residents, Leigh Lewis, Charles Mathers, Anil Menon, and Jennifer Law completed aerospace medicine training utilizing funding through the cooperative agreement. We continue to fill the medical needs at NASA with excellent physicians that do not require extensive training or time delay prior to being productive at NASA. To date, a total of 27 UTMB/NASA-JSC Space Medicine Fellows and Aerospace Medicine residents have been hired at NASA-JSC or with NASA contractors following completion of the program.

During this period, there were 3 UTMB/NASA-JSC residents in the four year combined IM/AM program and 4 in the two-year traditional space track. A total of 48 military aerospace medicine residents have studied and received an MPH degree in the UTMB Aerospace Medicine Residency Program. These residents work closely with UTMB residents and participate in a variety of aerospace medicine activities during their year at UTMB. These residents are not funded by NASA, but their operational experience and service experience greatly benefit the UTMB/NASA-JSC residents. In addition, the program provides a valuable service to our military.

## **COMMUNITY SERVICE**

During training, the residents are encouraged to participate in medically-related community service activities. In this grant period, the residents supported the 2011 Wings Over Houston Air Show and began planning for the October 2012 medical support for the Wings over Houston

Airshow. Becky Blue was the resident coordinator for 2011 and new resident David Reyes will be the coordinator for 2012. Residents also covered the Houston Marathon in 2012 and did clinical preceptorships at the St. Vincent's House Primary Care free clinic. UTMB ASM residents will provide care at the 2012 U.S. Grand Prix in Austin, Texas. We encourage this type of activity to facilitate training in point-of-injury care that would be needed should there be a training accident at GCTC, an aircraft accident, or a launch and landing contingency.

## **PERFORMANCE ON AMERICAN BOARD OF PREVENTIVE MEDICINE-AEROSPACE EXAMINATION**

The record of the residents on the preventive medicine certification examination offered by the American Board of Preventive Medicine continues to be outstanding. The results for the last seven years are listed below. Residents will sit for the 2010 examination in October.

- 2003 4/4 Passed
- 2004 0/0
- 2005 1/2 Passed
- 2006 3/3 Passed
- 2007 2/2 Passed
- 2008 1/1 Passed
- 2009 2/2 Passed (2 others passed IM Boards)
- 2010 1/2 Passed (1 that failed left program 7 years ago)
- 2011 1/1 Passed

## **RESIDENT PRESENTATIONS/PUBLICATIONS/ABSTRACTS/AWARDS 2012**

### **PRESENTATIONS**

#### **AsMA Annual Scientific Meeting, Atlanta GA, 2012**

**Becky Blue:** Commercial Spaceflight Passenger Tolerance of Acceleration Exposure During Centrifuge-Simulated Suborbital Flight

**Jennifer Law:** Emergency Medical Planning for Commercial Spaceflight Events: Medical Conditions, Medical Utilization, and Staffing Needs

Both of these papers have been submitted and accepted in *Aviation Space and Environmental Medicine* which makes both Becky and Jennifer eligible for the \$2000 AsMA Fellow's Award, sponsored by the Fellows and the AsMA Foundation.

Grand Rounds Presentations:

**Anil Menon and James Cushman** "Vertigo in an F-15 Pilot"

**Becky Blue and James Pattarini** "Coarctation of the Aorta in a Civil Aviation Pilot"

## **OTHERS:**

### **Menon:**

Mass Gathering Medicine, trauma symposium, Dhaka Bangladesh, July 2011.

Altitude medicine, UT Houston medical school, August 2011

Point-of-Injury Burn Care. Aerospace Medicine Grand Rounds, USRA Houston, August 2011

Point-of-Injury Burn Care. International Council of Motorsport Sciences Congress, Orlando, Florida, December 2011

Aerospace Medicine, Kaiser Permanente/Stanford EM Grand Rounds, 2011

## **PUBLICATIONS:**

### **Menon:**

Confessions of a wilderness medicine fellow: I can't live without my Smartphone, can you? *Kaiser Permanente Journal*

Air National Guard Medical Group Go Bags and Rapid Response Teams. *Aviat Space Environ Med*. 2011;82:375. Abstract

Patient and physician willingness to use personal health records in the ED. *Western J Emerg Med*, 2012

Confessions of a wilderness fellow: I can't live without my smart phone, Kaiser Permanente Journal.

Expanded scope of procedures in a disaster setting. *J Special Operations Med*.

### **Blue:**

O Griofa M, Blue R, Cohen K, O'Keeffe D. Sleep Stability in an Arctic Martian Sol. *Aviat Space Environ Med* 2011; 82(4): 434-41

O Griofa M, Blue R, Friedman R, Hamski P, Pal A, Rinehart R, Merrick T, Doerr D, and Cohen K. "Radio Frequency Impedance Interrogation Monitoring of Hemodynamic Parameters," in Proc. 2011 Annual Oak Ridge National Laboratory Biomedical Science and Engineering Conference (BSEC), Oak Ridge, TN, March, 2011.

O Griofa M, Blue R, Friedman R, Hamski P, Bhagavatula M, Jaech A, Hu SY, Saavides M. "Preliminary Feasibility Analysis of Remote Subject Identification during Hemodynamic Monitoring by Radio Frequency Impedance," in Proc. 2011 Annual Engineering in Medicine and Biology Society Conference (EMBC), Boston, MA, August, 2011.

O Griofa M, Blue R, Friedman R, Jaech A, Bhagavatula M, Hu SY, Savvides M. "Radio Frequency Cardiopulmonary Waveform for Subject Identification." in Proc. 2011 Asilomar Conference on Signals, Systems, and Computers, Pacific Grove, CA, November 2011. Invited Paper.

Jaech A, Blue R, Friedman R, O Griofa M, Savvides M, Vijaykumar BVK. Classification of Radio Frequency Cardiosynchronous Waveforms by Projection to a Legendre Polynomial Sub-Space To be published in Proc. 2012 Annual Engineering in Medicine and Biology Society Conference (EMBC), San Diego, CA, August 2012

Bhagavatula C, Venugopalan S, Blue R, Friedman R, O Griofa M, Savvides M, Vijaykumar BVK. Biometric Identification of Cardiosynchronous Waveforms Utilizing Continuous and Discrete Wavelet Transforms. To be published in Proc. 2012 Annual Engineering in Medicine and Biology Society Conference (EMBC), San Diego, CA, August 2012

Bhagavatula M, Savvides M, Bhagavatula V, Friedman R, Blue R, O Griofa M. Second-Degree Correlation Surface Features from Optimal Trade-off Synthetic Discriminant Function Filters for Subject Identification Using Radio Frequency Cardiosynchronous Waveforms. To be published in Proc. of IEEE International Conference on Image Processing, Orlando, FL, 2012.

Blue RS, Riccitello JM, Tizard J, Hamilton R, Vanderploeg JM. Commercial Spaceflight Participant Tolerance of G-Force Exposure During Centrifuge-Simulated Suborbital Flight. Accepted for publication, anticipated 2012, *Aviat Space Environ Med*.

Blue RS. Coarctation of the Aorta. Accepted for publication, anticipated 2013: Federal Air Surgeon's Medical Bulletin

#### **Mathers:**

Mathers CH, et al. Measurement of Accelerations Experienced by Rough Stock Riders. *Journal of Athletic Training and Sports Health Care*

#### **Law:**

Emergency medical planning for commercial spaceflight events. Accepted for publication *Aviat Space Environ Med*.

#### **ABSTRACTS:**

English KL, **Pattarini JM Mathers CH**, Paddon-Jones D. Leucine preserves muscle and strength and enhances recovery following bed rest. Exper Biol Nat Confer. San Diego April 2012.

English KL, **Pattarini JM, Mathers CH** et al. Preserving muscle mass and strength with nutrition during unloading. NASA HRP Investigators' Workshop, Houston. Feb 2012.

English KL, **Pattarini JM**, et al. Unable to exercise? Preserve muscle with nutrition. Sealy Center, Forum on Aging. Galveston. Nov 2011.

English KL, **Mathers CH, Pattarini JM**, et al. Leucine attenuates the loss of lean tissue mass and muscle strength during 14 d of bed rest disuse. Nat Center Human Perf 2011 Annual Meeting, Houston. November 2011.

Joni A. Mettler, **Mathers CH, Pattarini JM**, et al. Muscular endurance and neuromuscular function following 14 days of bed rest in middle-aged adults

**Menon**. A Prospective Cohort Study of Acute Kidney Injury in Multi-Day Ultramarathon Runners. *Society Acad Emerg Med*.

**Law J**. Emergency medical planning for commercial spaceflight events. *Aviat Space Environ Med*. 2012;83:304

**Blue B**. Commercial spaceflight passenger tolerance of acceleration exposure during centrifuge-simulated suborbital spaceflight. *Aviat Space Environ Med*. 2012;83:303.

## **FAA COE RESEARCH**

Definition and Design of Medical & Physiological Database Law and Mathers

Application of JSC's Human System Risk Management Approach to Commercial Suborbital & Orbital Flights Law and Mathers

Flight Crew Medical Standards & Passenger Acceptance Criteria Lewis and Mathers

Wearable Biomedical Monitoring Equipment Menon

Testing & Training of Personnel and Equipment Evaluation in High-G profiles using NASTAR Centrifuge Pattarini and Blue

## **RESIDENTS IN AEROSPACE MEDICINE RAM BOWL**

In May 2012, the residents participated in the 5<sup>th</sup> Annual Residents in Aerospace Medicine "RAM Bowl" and defeated 3 teams from the U.S. Air Force and 3 teams from the U.S.

Army/Navy program to capture the traveling Louis Bauer "RAM Bowl" Trophy. UTMB has won this competition 4 times. This event was attended by approximately 250 and was a highlight of the scientific meeting.

## AEROSPACE MEDICINE RESIDENTS Since 1996

Resident Name	Training Yrs	Program Completed		Location
		Yes	No	
Jones, Jeff (MS)	1996-1998	✓		Flight Surgeon, NASA-Johnson Space Center, Houston, TX
Hart, Stephen (MS)	1997-1999	✓		Flight Surgeon, NASA-Johnson Space Center, Houston, TX
Locke, Jim (MS)	1997-1999	✓		Flight Surgeon, NASA-Johnson Space Center, Houston, TX
Arenare, Brian (MS)	1998-2000	✓		Medical Officer, Kelsey-Seybold/NASA-Johnson Space Center, Houston, TX
Sheehan, Mark (MS)	1998-2000	✓		Physician- UTMB/Wyle, Flight Analog Research Unit/Medical Monitoring, Houston, TX
Brady, Charles (MS)	1998-2000	✓		Physician Astronaut, NASA-Johnson Space Center, Houston, TX (Deceased)
Feinberg, Mike (MS)	1999-2000	✓		Aerospace Medicine, California
Bacal, Kira (MS)	1999-2001	✓		Flight Surgeon, NASA-JSC, Houston, TX (initial) Mauri Ora Associates-Health Care Consultant, New Zealand (current)
Roden, Sean (MPH)	2000-2002	✓		Flight Surgeon- UTMB/Wyle, Houston, TX (initial) Flight Surgeon- NASA/Johnson Space Center, Houston, TX (previous) Physician- Bryan, TX (current)
Stepanek, Jan (MPH)	2000-2002	✓		Physician/Director- Executive Health Program, Mayo Clinic, Scottsdale, AZ
Schmid, III, Josef (MPH)	2000-2002	✓		Flight Surgeon, NASA-Johnson Space Center, Houston, TX
Dervay, Joseph (MS, MPH)	1994-1995 2001-2002	✓		Flight Surgeon, NASA-JSC, Houston, TX
Cho, Won-Suk (MPH)	2000-2004	✓		Unknown
Gilmore, Stevan (MPH)	2001-2003	✓		Flight Surgeon, NASA- JSC, Houston, TX
Herrera, David	2001-2003		✓	Unknown
Patton, Thomas (MPH)	2002-2004	✓		United States Navy
Langell, John (MPH)	2002-2004	✓		Physician/Assistant Professor of Surgery & Director, Acute Care Surgery- University of Utah
Ashley, Bradford (MPH)	2003-2005	✓		Physician, Private Consultation- Oregon
Chamberlain, Blake (MPH)	2003-2005	✓		Flight Surgeon- UTMB/Wyle, Houston, TX



Moynihan, Shannan (MPH)	2003-2005	✓		Flight Surgeon- UTMB/Wyle, Houston, TX (initial) Flight Surgeon- NASA-Johnson Space Center, Houston, TX
Louis Andy Davenport (MPH) IM/AM	2004-2009	✓		F-16 IP Kelly AFB
Aunon, Serena(MPH)	2005-2007	✓		Flight Surgeon- UTMB/Wyle, Houston, TX (initial) Physician Astronaut- NASA Johnson Space Center (current)
Kerstman, Eric (MPH)	2005-2007	✓		Physician- UTMB/Wyle, Advanced Projects, Houston, TX
Lindgren, Kjell (MPH)	2006-2008	✓		Flight Surgeon- UTMB/Wyle, Houston, TX (initial) Physician Astronaut- NASA Johnson Space Center (current)
Watkins, Sharmila (MPH) IM/AM	2005-2009	✓		Physician Lead- UTMB/Wyle, Advanced Projects, Houston, TX
Riccitello, Jon (MPH) IM/AM	2005-2009	✓		Staff Physician- Virtual Flight Surgeons, CO
Barr, Yael (MPH) IM/AM	2005-2009	✓		Physician- UTMB/Wyle, Advanced Projects, Houston, TX
Cole, Richard (MPH)	2007-2009	✓		Flight Surgeon- UTMB/Wyle, Houston, TX
Shaskan, Greg (MPH)	2008-2010	✓		Flight Surgeon- UTMB/Wyle, Houston, TX (deceased)
Mathers, Chuck (MPH) IM/AM	2007-2011	✓		Physician- Executive Health Program, Mayo Clinic, Scottsdale, AZ
Lewis, Leigh (MPH) IM/AM	2008-2012	✓		FAA Civil Aerospace Medicine Institute, Mayo Clinic Jacksonville
Ronak Shah (MPH)	2009-2011	✓		TBD
<b>Current Residents</b>				
Anil Menon (MPH)	2010-2012		✓	Physician- UTMB/Wyle, Advanced Projects, Houston, TX
Jennifer Law (MPH)	2010-2012		✓	UTMB Flight Surgeon- NASA/Johnson Space Center, Houston, TX (July 2012)
James Pattarini (IM/AM)	2010-2014		✓	UTMB
Rebecca Blue	2011-2013		✓	UTMB
James Cushman	2011-2013		✓	UTMB

UTMB/NASA-JSC ASM Fellows Hired at NASA:

Thomas Marshburn

Patricia Hilliard-Robertson

Terrence Pattinson

Alfred Rossum

**University of Texas Medical Branch  
Aerospace Medicine  
GRAND ROUNDS  
2011-2012**

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## **2011**

### **January 25, 2011**

“Ending the Coronary Artery Disease Epidemic – Making Yourself Heart Attack Proof ”

Caldwell B. Esselstyn, Jr., M.D.,

Cardiology, Cleveland Clinic Wellness Institute, Lyndhurst, OH

### **February 22, 2011**

“Human Performance Enhancement Technology to Prevent Spatial Disorientation and Motion Sickness”

Wesley W O Krueger MD, and Romie Richardson, MD

Advitech, Inc, San Antonio, TX

### **March 22, 2011**

“Spaceflight’s Contribution to Chilean Mine Rescue”

James D. Polk, DO

Chief of Space Medicine, NASA-JSC, Houston, TX

### **April 26, 2011**

“Earthquake! The Stanford Emergency Medical Response to Haiti”

Paul S. Auerbach, MD, MS,

Surgery, Stanford University, Stanford, CA

### **May 24, 2011**

“Effects of Light and Potential Applications With NASA”

Steven W. Lockley, PhD

Assistant Professor, Division of Sleep Medicine

Brigham and Women’s Hospital, Harvard, Boston, MA

### **June 28, 2011**

“The Integrated Medical Model: A Risk Assessment and Decision Support Tool for Human Space Flight”

Eric L. Kerstman, MD, MPH

Physician- Advance Projects, CSG

UTMB/Wyle Integrated Science & Engineering, Houston, TX

### **July 26, 2011**

“A Transport-Kinetics Computational Model for Simulation of Renal Stone Growth in 1g and Microgravity”

Mohammad (Mo) Kassemi, PhD

Chief Scientist, National Center for Space Exploration Research

NASA Glenn Research Center, Cleveland, OH

### **August 23, 2011**

“Point of Care Treatment of Burns”

Anil S. Menon, MD, MPH

Aerospace Medicine Resident

University of Texas Medical Branch, Galveston, TX

**September 27, 2011**

"Impacts of Altered Gravity on Male and Female Reproductive Health"

Joseph S. Tash, Ph.D.

Professor

University of Kansas Medical Center, Kansas City, KS

**October 25, 2011**

"Behavioral Adaptation to Space Flight"

Michael R. Barratt, MD

Physician Astronaut

NASA Johnson Space Center, Houston, TX

**November 22, 2011** (*Ethics CME*)

"Cultural Competence, Culture/Medicine/Technology, Medical Error, or Professional Integrity"

Rebecca J Hester, MA, PhD and Jerome Crowder, PhD

Institute for Medical Humanities

University of Texas Medical Branch, Galveston, TX

**December 2011**

Winter Holiday Break

**2012****January 24, 2012**

"Brain Music Treatment"

Galina Mindlin, M.D., Ph.D

Assistant Clinical Professor, Psychiatry

Columbia University, New York, NY

**February 28, 2012**

"From Space to the Battlefield: Harnessing the Respiratory Pump for Treatment of Hypovolemic Hypotension"

Victor A. Convertino, Ph.D.

US Army Institute of Surgical Research, Fort Sam Houston, TX

**March 27, 2012**

"Consequences of Medication Shelf Life for Spaceflight and Remote Operations"

Virginia E. Wotring

Universities Space Research Association, Division of Space Life Sciences

NASA Johnson Space Center, Houston, TX

**April 24, 2012**

"Report on National Space Biomedical Research Institute"

Jeffrey P. Sutton, M.D., Ph.D.

Director

National Space Biomedical Research Institute, Houston, TX

**May 22, 2012**

"NASA'S Spaceflight Visual Impairment Intracranial Pressure (VIIP) Risk: Clinical Correlations and Pathophysiology"

William J. Tarver, MD

Deputy Chief and Medical Director, NASA Clinical Services Branch

NASA Johnson Space Center, Houston, TX

Christian Otto, MD

Visual Impairment and Intracranial Pressure Project Lead Scientist  
Universities Space Research Association, Division of Space Life Sciences  
NASA Johnson Space Center, Houston TX

**June 26, 2012**

Melchor J. Antuñano, MD, MS  
Director, Civil Aerospace Medical Institute  
Federal Aviation Administration, Oklahoma City, OK

**July 24, 2012**

Gailen D. Marshall, Jr., MD, PhD, FACP  
Professor of Medicine and Pediatrics  
Vice Chair for Research  
Director, Division of Clinical Immunology and Allergy  
Chief, Laboratory of Behavioral Immunology Research  
Department of Medicine, University of Mississippi Medical Center  
Jackson, MS

**August 28, 2012**

TBD

**September 25, 2012**

Jay A. Johannigman MD  
Division of Trauma and Critical Care  
Department of Surgery  
University Hospital, Cincinnati Ohio

**October 23, 2012**

TBD

**November 27, 2012**

TBD

**December, 2012**

Winter Holiday

**University of Texas Medical Branch  
Aerospace Medicine  
JOURNAL CLUB  
2011-2012**

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Chapter Reviews from the "Fundamentals of Aerospace Medicine" – 4<sup>th</sup> edition  
J. Davis, R. Johnson, J. Stepanek, J. Fogarty

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## **2011**

### **January 10, 2011**

Article: "Oxygen Consumption at Altitude as a Risk Factor for Altitude Decompression Sickness", Webb, J T; Krock, L P; and Gernhardt, M L., ASEM; Nov. 2010, 81(11) Pgs (987-992): A37-A44

Reviewer: James Pattarini, MD

Chapter 9 - Aerospace Toxicology & Microbiology

Chapter 19 - Infectious Diseases

Chapter 28 - The Practice of International Aerospace Medicine

Reviewer: Leigh Lewis, MD, MPH

### **February 7, 2011**

Article: "The Martian chronicles: remotely guided diagnosis and treatment in the Arctic Circle." Otto, C; Comtois, JM; Sargsyan, A; prep: Menon, A; Surg Endosc; March 13; 2010; DOI 10.1007/s00464-010-0917-1

Reviewer: Anil Menon, MD

Chapter: 11 – Pilot Health and Aeromedical Certification

Chapter: 13 – Clinical Aerospace Cardiovascular Medicine

Chapter: 14 – Ophthalmology in Aerospace Medicine

Reviewer: Jennifer Law, MD

### **March 7, 2011**

Article: "Risk of Renal Stones during Spaceflight Countermeasure Development" ASEM; Vol. 81, No.6, June 2010, pgs 606 – 607

Reviewer: Yvette Guzman, MD

Chapter: 18 – Endocrine System and Nephrology

Chapter: 22 – Women's Health Issues in Aerospace Medicine

Chapter: 23 – An Introduction to Human Factors in Aerospace

Reviewer: Chuck Mathers, MD, MPH

### **April 4, 2011**

Article: "Sedentary Long-Duration Head-Down Bed Rest and ECG Repolarization Heterogeneity" ASEM ; April, 2011, Vol 82; pgs 416 – 423

Reviewer: Susan Fondy, MD

Chapter: 21 – Occupational and Environmental Medical Support to the Aviation Industry

Chapter: 25 – Aircraft Accidents: Investigation and Prevention

Chapter: 27 – Aerospace Medicine in Unique Environments

Reviewer: RAM Bowl Practice

**May 2, 2011**

AsMA Conference

**June 6, 2011**

Article: "Characterization of Airway Device Cuff Volumes at Simulated Altitude"; ASEM; Vol. 82, #5, Section I; May, 2011 pgs 555-558; Author: Law, J; Bair, A; Capra, J; Holder, A; Allen, R  
Reviewer: Reviewer: Jennifer Law, MD, MPH

**July 2011****July 11, 2011**

Article: "Weight Loss in Humans in Space"; ASEM; Vol. 82, #6, June, 2011 pgs 615-621; Author Matsumoto, A; Storch, KJ; Stolfi, A; Mohler, SR; Frey, MA; Stein, TP  
Reviewer: Susan Fondy, MD

Chapter 1 – The Beginnings Past and Present

Chapter 21 – Occupational and Environmental Medical Support to the Aviation Industry

Chapter 29 – Aviation, Government Space, Biomedical Innovations, and Education

Chapter 30 – Commercial Human Space Flight

Reviewer: Jennifer Law, MD, MPH

**August 3, 2011**

Article: "Visual Side Effects of Scopolamine/Dextroamphetamine Among Parabolic Fliers"; ASEM Jrn, July, 2011; Vol. 82, #7, June, 2011 pgs 683-688; Author Makowski, AL; Lindgren, K; Locke, JP

Reviewer: Chuck Mathers, MD, MPH

Chapter 2- Respiratory Physiology and Protection Against Hypoxia

Chapter 4 – Human Response to Acceleration

Chapter 12 – Respiratory Diseases Aeromedical Implications

Reviewer: Leigh Lewis, MD, MPH

**September 6, 2011**

Article: "Tolerance to Extended Galvanic Vestibular Stimulation Optimal Exposure for Astronaut Training"; ASEM Jrn, August, 2011; Vol. 82, #8, June, 2011 pgs 770-774; Author Dilda, Valentina; MacDougal, Hamish G; Moore, Steven T.

Reviewer: Rebecca Blue, MD

Chapter 3 - Physiology of Decompressive Stress

Chapter 15 – Otolaryngology in Aerospace Medicine

Chapter 20 – Dental considerations in Aerospace Medicine

Reviewer: James Pattarini, MD

**October 3, 2011**

Article: "Optic Disc Edema, Globe Flattening, Choroidal Folds, and Hyperopic Shifts Observed in Astronauts after Long-duration Space Flight"; *Ophthalmology* 2011;118:2058–2069.

Author(s) Mader, Gibson, Pass, Kramer, Lee, Fogarty, Tarver, Dervay, Hamilton, Sargsyan, Phillips, Tran, Lipsky, Choi, Stern, Kuyumjian and Polk

Article Reviewer: Leigh Lewis

Chapter 5 – Vibration and Acoustics

Chapter 14 – Ophthalmology in Aerospace Medicine

Reviewer: Anil Menon

**November 7, 2011**

Article: "Automated Collection of Fatigue Ratings at the Top of Descent A Practical Commercial Airline Tool"; *Avia Space & Enviro Med*; Vol 82, No 11, pages 1037-1041.

Author(s) Powell, D M C; Spencer, M B; Petrie, K J  
Reviewer: Jim Pattarini

Chapter 6 – Spatial Orientation in Flight  
Chapter 16 –Aerospace Neurology  
Reviewer: Jim Cushman

### **December 5, 2011**

Article: "Space Adaptation Back Pain A Retrospective Study"; (slated for publication) - *Avia Space & Enviro Med*; Vol 83, No 1, Jan, 2012  
Reviewer: Anil Menon

Chapter 7- Thermal Stress  
Chapter 8 – Cosmic Radiation  
Chapter 27 –Aerospace Medicine Issues in Unique Aircraft Types  
Reviewer: Chuck Mathers

## **2012**

### **January 9, 2012**

Article: "Pre-Dive Exercise and Post-Dive Evolution of Venous Gas Emboli"; *Avia Space & Enviro Med*; Vol 83, No 1, Jan, 2012 – Reviewer: Becky Blue  
Reviewer: Becky Blue

Chapters - Fundamentals of Aerospace Medicine-4<sup>th</sup> Edition:  
Chapter 9 - Aerospace Toxicology & Microbiology  
Chapter: 13 – Clinical Aerospace Cardiovascular Medicine  
Chapter 19 - Infectious Diseases  
Reviewer: Jen Law

### **February 6, 2012**

Article Review:  
Reviewer: Jim Cushman

Chapters - Fundamentals of Aerospace Medicine-4<sup>th</sup> Edition:  
Chapter: 10 – Space Environments  
Chapter: 24 – Space Operations  
Reviewer: Becky Blue

### **March 5, 2012**

Article Review:  
Reviewer: Jen Law

Chapters - Fundamentals of Aerospace Medicine-4<sup>th</sup> Edition:  
Chapter: 11 – Pilot Health and Aeromedical Certification  
Chapter: 17 – Aerospace Psychiatry  
Chapter: 18 – Endocrine System and Nephrology  
Chapter 28 - The Practice of International Aerospace Medicine  
Reviewer: Anil Menon

### **April 2, 2012**

Article Review:

Reviewer: Chuck Mathers

Chapters - Fundamentals of Aerospace Medicine-4<sup>th</sup> Edition:

Chapter: 22 – Women's Health Issues in Aerospace Medicine

Chapter: 23 – An Introduction to Human Factors in Aerospace

Chapter: 26 – Aviation Medicine in Unique Environments

Reviewer: James Pattarini

**May 7, 2012**

Article Review:

Reviewer: Jim Cushman

Chapters - Fundamentals of Aerospace Medicine-4<sup>th</sup> Edition:

Chapter: 25 – Aircraft Accidents: Investigation and Prevention

Reviewer: Becky Blue

**June 4, 2012 –**

TBD



**Aerospace Medicine Residency  
Master of Public Health  
CAPSTONE COMMITTEES AND TITLES  
2005 – Present**

<b>STUDENT</b>	<b>COMMITTEE MEMBERS</b>	<b>TITLE</b>
Aunon, Serena	Richard Jennings Ronita Cromwell Judith Drew	Artificial Gravity: Applications Beyond NASA
Barr, Yael	Sheryl Bishop Robert Johnson Juan Olano	The Risk and Management of Breast Cancer for Space Exploration
Blue, Rebecca	James Vanderploeg Christine Arcari Jon Riccitello	Commercial Spaceflight Participant G-Force Tolerance During Centrifuge-Simulated Suborbital Flight.
Beauregard, Wesley	Melanie de Boer Daniel Freeman Alan Barrett	West Nile Virus Vaccination: Current threats and Future Considerations
Cole, David	Laura Rudkin Jean Freeman Bret Simon	Treatment Programs for Alcoholism in Native Americans
Cole, Richard	Richard Jennings Strahil Atanasov James Vanderploeg	Effect of Zaleplon, Zolpidem, and Ramelteon on Cognitive Functioning after Awakening from Napping
Cushman, James	Richard Jennings Joseph Dervay Christine Arcari	Being a Flight Surgeon
Davenport, L. Andy	Sheryl Bishop Robert Johnson Nitza Cintron	Design and Implementation of the Pilot Physician Program for the U.S. Air Force – Air National Guard
Fondy, Susan	Laura Rudkin Sharmila Watkins Jean Freeman	Medical Constraints in Spaceflight: Venturing Beyond Low Earth Orbit
Gaydos, Steve	Laura Rudkin Nelson Avery Alvah Cass	Taser Subjects: Identification of High-Risk Individuals
Gray, Jon	Laura Rudkin Dana Beckham Elizabeth Reifsnider	A Survey of Obesity-Related Programs in Galveston County Schools
Hyland, Greg	Robert Johnson LaDale St. Clair Randal Reinertson	Diabetes Mellitus in US Aviators: Identification of Risks and Emphasis on Prevention
Jacques, Mark	Robert Johnson Richard Jennings Prashanth Sunkureddi	Gout: An Aeromedical Clinical Practice Guideline for the Management and Treatment of this Disease
Law, Jennifer	James Vanderploeg John Fraser Smith Johnston	Development of an Emergency Medical Services Plan for Commercial Space Flights in Spaceport America
Lewis, Leigh	Richard Jennings James Vanderploeg Jonathan Clark	Measurement of Accelerations Experiences by Aerobatic Pilots

Lindgren, Kjell	Robert Johnson Sheryl Bishop John Fraser	Air Show Medical Support
Mathers, Charles	Richard Jennings James Vanderploeg Jonathan Clark	Measurement of Accelerations Experienced by Rough Stock Riders: A Model for Examining Acceleration-Induced Head Injuries in Astronauts
Menon, Anil	Richard Cole James Vanderploeg John Fraser	Medical Kits for Commercial Space Applications
Powell- Dunford, Nicole	Robert Johnson Richard Jennings James Vanderploeg Janice Smith	Dysmenorrhea: An Aeromedical Clinical Practice Guideline
Riccitello, Jon	Sheryl Bishop Gary Kesling Jerry Baskerville	'ICE' Awareness Among Local EMS Personnel
Shah, Ronak	James Vanderploeg John Fraser Sharmila Watkins	Sensorimotor Disturbances in Astronauts Following Space Flight: Causes, Evaluation, and Countermeasures
Shaskan, Gregory	Richard Jennings Dan Freeman Melchor Antunano	2007 Homebuilt/Experimental Accident and Fatality Rates Compared to Non-Homebuilt General Aviation Aircraft
Strobel, Jonathan	Laura Rudkin Dan Freeman Ruth Levine	Media Induced Anxiety in the Active Duty Medical Clinic Setting
Stinson, Jonathan	Christine Arcari Laura Rudkin Miriam Alter	Acute/Febrile Respiratory Illness Aboard Ships in the US Navy
Watkins, Sharmila	Robert Johnson Nelson Avery Jonathan Clark	Measurement of Accelerations Experiences by Rough Stock Riders

<b>ASM Residents 2011-2012</b>	
<b>Ronak Shah</b>	
<ul style="list-style-type: none"> <li>▪ DO- New York College of Osteopathic Medicine</li> <li>▪ Internal Medicine Morristown Memorial Hospital</li> <li>▪ Diplomate ABIM</li> <li>▪ Coordinator Wings Over Houston 2009</li> <li>▪ Mountain Climbing</li> </ul>	
<b>Charles Mathers, M.D.- (combined IM/ASM)</b>	
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<b>Leigh Lewis (Combined IM/ASM)</b>	
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<b>Anil Menon</b>	
<ul style="list-style-type: none"> <li>▪ BA- Harvard</li> <li>▪ MS- Engineering Stanford</li> <li>▪ MD- Stanford</li> <li>▪ Emergency Medicine Stanford</li> <li>▪ Wilderness Medicine Stanford</li> <li>▪ Flight Surgeon, Oregon Air National Guard</li> <li>▪ Pilot, CFI, SCUBA, Ironman Triathlons</li> <li>▪ Wings Over Houston Coordinator 2010</li> </ul>	
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<b>James Pattarini (combined IM/ASM)</b>	
<ul style="list-style-type: none"> <li>▪ BS Syracuse</li> <li>▪ MD, University of Buffalo State University</li> <li>▪ Pilot, Parachuting, Tae Kwon Do</li> </ul>	
<b>Becky Blue</b>	
<ul style="list-style-type: none"> <li>▪ BS- Truman State University</li> <li>▪ MD- Georgetown University</li> <li>▪ Emergence Medicine, Orlando Health</li> </ul>	

- Diving, rock climbing, flying
- Wings Over Houston Coordinator 2011

**James Cushman**

- BA- Washington University
- MD- Columbia University
- Surgery Residency, St. Vincent's Hospital and Medical Center
- Trauma and Critical Care Fellowship, UC San Diego
- Diplomate, American Board of Surgery, General Surgery, Critical Care
- Associate Professor of Surgery, University of Maryland Dept of Surgery
- PTHLS Coordinator 2011

**David Reyes, MD**

- BS- Radford University
- MD- University of Colorado
- Family Medicine Residency, UNM- Northern New Mexico Family Practice
- MS- Arizona State University
- MPH- University of Arizona
- Safety Officer
- Airfield Operations Specialist, USAF Reserves
- Private Pilot License with Glider Rating

**Robert Mulcahy, MD**

- BA- Rice University
- MD- University of Texas Medical Branch
- Combined IM/ASM
- SCUBA